SPECIFICATION AMENDMENTS:

Please replace the paragraph on page 3, lines 22 through page 4, line 29, with the following amended paragraph:

As shown in FIG. 1A, the I/Q imbalance at the receiver is expressed as a 2*2 matrix function composed of parameters $\alpha_r\cos\theta_r$, $\alpha_r\sin\theta_r$, $\beta_r\cos\phi_r$ and $\beta_r\sin\phi_r$, where α_r and β_r are gain offsets while θ_r and ϕ_r are phase offsets of the I and Q demodulation path in the receiver. The four parameters of the receiver I/Q imbalance matrix can be estimated in an embodiment of the present invention by generating a signal with a specific frequency before inverse fast Fourier Transform (IFFT). The signal with the specific frequency is transmitted in the from of a time-domain signal with either imaginary or real part power. Thus, the signal is transmitted through only one of the I and Q modulation paths of the transmitter. The gain and phase offsets of the signal can be compensated by the automatic gain control and carrier recovery circuit in the receiver. In this manner, the parameters $\alpha_r\cos\theta_r$ and $\beta_r\sin\theta_r$ are derived through transmitting a time-domain real part power signal while the parameters $\alpha_r\sin\theta_r$ and $\beta_r\cos\theta_r$ are derived through transmitting from a time-domain imaginary part power signal.

As shown in FIG. 1B, the I/Q imbalance at the transmitter is expressed as a 2*2 matrix function composed of parameters $\alpha_t\cos\theta_t$, $\alpha_t\sin\theta_t$, $\beta_t\cos\phi_t$ and $\beta_t\sin\phi_t$, where α_t and β_t are gain offsets while θ_t and ϕ_t are phase offsets of the I and Q modulation path in the transmitter. The four parameters of the transmitter I/Q imbalance matrix can be estimated in an embodiment of the present invention by transmitting two signals, each of which includes the power of the real and imaginary part in the time domain, in two different periods and demodulating them at the receiver through the same demodulation path. In the demodulation of each signal received by the receiver, two orthogonal carriers are used to respectively demodulate the real and imaginary parts of time-

domain signals from the received signal. The parameters $\alpha_t \cos\theta_t$ and $\beta_t \sin\theta_t$ are derived from the real part of two receiving signals while the parameters $\alpha_r \sin\theta_r$ and $\beta_r \cos\theta_r$ are derived from the imaginary part of two receiving signals. The estimated signal may include the gain and phase offsets. However, it can be compensated by channel effect processing.